Partner Reported Opportunities (PROs)
For Reducing Methane Emissions

Replace Gas Starters with Air

Compressors/Engines ■
Dehydrators ☐
Pipelines ☐
Pneumatics/Controls ☐
Tanks ☐
Valves ☐
Wells ☐
Other ☐

Applicable sector(s):

■ Production ■ Processing ■ Transmission and Distribution

Partners reporting this PRO: ExxonMobil Company

Other related PROs: Install Electric Starters, Convert Engine Starting to Nitrogen, Install Instrument Air Systems, Reduce the Frequency of Engine Starts with Gas

Technology/Practice Overview

Description

In the natural gas industry, internal combustion engines for compressors, generators, and pumps are often started using small gas expansion turbine starter motors. High-pressure natural gas is stored in a volume tank while a compressor is running. The pressurized gas is expanded across the starter turbine, initiating startup of the engine, and then exhausted to the atmosphere.

Partners have found that replacing the natural gas with compressed air for engine starting can reduce methane, VOC and HAP emissions.

Methane Savings

1,356 Mcf/yr

Costs

Capital Costs (including installation)
■ <$1,000 ☐ $1,000-$10,000 ☐ >$10,000

Operating and Maintenance Costs (Annual)
☐ <$100 ■ $100-$1,000 ☐ >$1,000

Payback (Years)

■ 0-1 ☐ 1-3 ☐ 3-10 ☐ >10

Principal Benefits

Reducing methane emissions was:

■ **The primary benefit of the project** ☐ **An associated benefit of the project**

Operating Requirements

Stationary or mobile air compressor is required for this practice.

Applicability

This practice is applicable for all natural gas pneumatic starter motors.

Methane Emission Reductions

The methane emission savings are based ten compressor start-up attempts using factors in Perry's Chemical Engineers' handbook, Sixth Edition, p. 24-15: 0.5 cf of gas per HP at 250 psig stored to operate the starting motor. EPA/GRI Study, "Methane Emissions from The Natural Gas Industry" Volume 8, reported 1,341 Mcf/yr leakage from compressor starter open-ended lines. One partner reported methane savings of 500 Mcf/yr for multiple applications.

Economic Analysis

Basis for Costs and Savings

Reported methane emission savings of 1,356 Mcf/yr apply to one 3,000 HP reciprocating compressor that requires ten start-ups per year. The compressor starter open-ended line is assumed to have average leakage.

Discussion

This project can result in quick payback and the primary benefit is to save methane emissions. The capital cost is the installation of piping between an existing air compressor and the starter is assumed to be incremental to the cost of the air compressor already used for pneumatic controls. Operating cost includes the electrical power needed to compress the air. Associated benefits include reduced VOC and HAP emissions.